NASA Guidance to Implement Executive Order 13148 *Greening the Government through Leadership in Environmental Management*

March 5, 2001

Prepared by:
Science Applications International Corporation
11251 Roger Bacon Drive
Reston, VA 20190

Contract #: GS-23F-8006H / W-23894

TABLE OF CONTENTS

Executive Summary

The National Aeronautics and Space Administration (NASA) is committed to environmental leadership. NASA has consistently undertaken measures to demonstrate this commitment through the management of NASA facilities and activities. NASA has gone beyond the minimum effort required to comply with environmental regulations and has welcomed partnerships with local communities and regulators.

These actions are strong examples of NASA's leadership in environmental management. In keeping with the federal government's commitment to environmental leadership, President Clinton signed Executive Order 13148, *Greening the Government through Leadership in Environmental Management* on April 21, 2000. This executive order requires all federal agencies to adopt practices that will establish the government's lead role in environmental management.

The executive order sets specific goals for federal agencies. These goals are:

1. Develop and Implement Environmental Management Systems
2. Establish and Implement Environmental Compliance Audit Programs
3. Revise Pollution Prevention Plan
4. Report Center Activities Under EPCRA
5. Reduce TRI Releases and Off-Site Transfers
6. Reduce Use of Toxic Chemicals, Hazardous Substances, and Other Pollutants
7. Develop a Plan to Phase Out the Procurement of Ozone Depleting Substances
8. Implement Environmentally Sound Landscaping Practices
9. Comply with E.O. 13148 Requirements and Note E.O. 13148 Recommendations

This implementation document presents a summary of each goal and describes the specific actions that NASA could take to implement each goal. The executive order calls for some of the actions explicitly, and others are included as additional actions that will support the implementation of required actions. The document serves as guidance for HQ and the Centers in their implementation of the E.O. and presents short statements. It is intended to be used as a starting point for developing a detailed plan for implementation. The plan also contains information on how NASA can integrate environmental accountability into day-to-day operations (**Appendix A**) and presents outlines of written plans for implementing EO 13148 for NASA HQ Environmental Management Division and for NASA Centers (**Appendices B and C**). **Appendix D** presents a template of a pollution prevention plan that NASA Centers can use to update their plans.

NASA has demonstrated environmental leadership for each of the goals listed above. NASA has conducted International Organization for Standardization (ISO) 14001 gap analyses at many of its facilities and conducts environmental management self-assessments following ISO 14001, an internally recognized standard. Most NASA facilities have thorough environmental compliance audit programs in place and make maintaining compliance a high priority. All NASA facilities are in compliance with

EPCRA and many have demonstrated considerable reductions of releases and transfers of chemicals in keeping with the goals of Executive Order 12856, the predecessor of EO 13148. NASA Centers are actively engaged in reducing the use of toxic chemicals and have implemented many measures to eliminate or substitute for those chemicals. NASA has reduced the procurement of ozone depleting substances significantly in the last ten years. Finally, NASA employs environmentally sound landscaping practices at almost all of its facilities.

The state of NASA's environmental program is strong. NASA currently demonstrates environmental leadership in many areas, thus saving NASA funding resources. This does not mean that NASA facilities should direct their efforts to other programs. NASA will continue to benefit greatly from transferring proven approaches to environmental management from one facility to another, in addition to sharing and utilizing new environmentally sound technologies with both and private and public sectors. In addition, each facility still has room to improve on its environmental record before the facility can show full compliance with the requirements of EO 13148. This plan identifies some of the specific implementation actions, as prescribed in E.O. 13148, NASA can take to continue to lead in environmental management.

Implementation of Executive Order 13148

President Clinton signed Executive Order 13148, *Greening the Government through Leadership in Environmental Management*, (EO 13148) on April 21, 2000.[1] The purpose of this executive order is to ensure that federal agencies integrate environmental accountability into day-to-day decision making and long-term planning processes. The executive order lists seven goals through which federal agencies will integrate environmental management considerations into their operations. This guide addresses each goal as it applies to NASA at both the headquarters and facility level. The suggested actions under each goal are listed in rough chronological order, although some actions may be conducted concurrently.

Goal 1. Develop and Implement Environmental Management Systems

Section	Primary Responsibility	Other Responsible Organizations
201	*Environmental Management Division*	*NASA Administrator* *All HQ Codes* *NASA Centers*

This goal is the most important of all, but will require the most effort to achieve. This goal is made difficult because it is hard to measure the success of an organization's environmental management system (EMS). Many of the other goals and objectives listed in EO 13148 are directly measurable. Measuring the success of an EMS is difficult; however, the health of an EMS can be assessed through EMS audits or reviews. EMS reviews adhere to a set of overarching guidelines, such as the Code of Environmental Management Principles (CEMP)[2] or the International Organization for Standardization (ISO) 14001.

NASA has already performed an ISO 14001 gap analysis at each NASA Center and Component Facility (except JPL), which concluded that NASA is already accomplishing over 80% of the activities required for an EMS according to the ISO 14001 1996 standard.[3]

NASA also is a signatory to the CEMP. The CEMP contains five principles of environmental management that each participating agency has committed to achieve. NASA is also in the process of implementing ISO 9001.

[1] For the complete text of EO 13148, go to http://www.whitehouse.gov/
[2] 61 **Federal Register** *54062*.
[3] *Environmental Management Division ISO 14000 Business Case*; Mega-Tech.

Suggested Actions for HQ Environmental Management Division:

- ***Select the NASA EMS Protocol*** – NASA has chosen the ISO 14001 standard as a foundation for the NASA EMS protocol and will work with the NASA Center Environmental Managers to prepare a standard set of categories and review criteria for NASA's EMS. The goal is to establish minimum Agency-wide requirements allowing Centers to address Center-specific requirements. EO 13148 requirements not addressed by ISO 14001, such as environmental compliance reviews, will be added. An ISO 14001 gap analysis was performed at each NASA Center and Component Facility (except JPL) in 1998, which concluded that NASA is already accomplishing over 80% of the activities required for an EMS. A draft NASA Procedures and Guidelines, *NASA Environmental Management (EMS) Procedures Manual*, currently exists, has been reviewed by the EMB, and should go out for formal Agency-wide review by June 2001. After pilot projects are completed at Glenn, Johnson and Stennis and a cost and savings report is completed, the Environmental Management Board will review the results to determine whether to recommend Agency-wide third-party certification. If necessary or requested, the results of the pilot study will also be resented to the Capital Investment Council (CIC) to obtain concurrence. NASA Centers have a large variety of unique environments, activities and processes which makes implementation of an Agency-wide EMS challenging. The use of a single EMS protocol throughout NASA will allow Centers to receive assistance from each other without having to educate other Centers about their EMS protocol. The adoption of a single protocol does not mean that every NASA Center must use the same approaches to implement their EMS, because each Center will assign different priorities to a given approach

- ***Conduct an Environmental Management Review (EMR) of NASA HQ*** – An agency-level environmental management system self-assessment / gap analysis was performed in 1998. (Required by section 401(a) of EO 13148. Must be completed by October 21, 2001)

- ***Select a NASA Center for an EMS Pilot Project*** – Three NASA EMS pilot projects are underway at Glenn, Johnson and Stennis. It is anticipated that these pilots will be completed by April 2001. These pilots will include independent validation and verification. The pilot project will involve conducting NASA's Environmental Functional Review (EFR) (which contains EMR elements) and implementing the findings of the EFR. The EFR should also address the relationship between the Center and HQ and other parts of NASA, such as the Institutional Program Offices. (Required by section 401(b) of EO 13148. Must be completed by April 21, 2002.)

- ***Implement EMS at All NASA Facilities*** – After completing the Center-level pilot projects, the Environmental Management Division should prepare a standard approach for conducting EMRs and implementing findings so that the process can be conducted at every NASA Center. The Environmental Management Division should assist every NASA Center with the implementation of EMSs. Ideally, the Centers should complete the facility-level EMRs before preparing updates to facility pollution prevention plans. NASA anticipates that EMSs will be in place at all appropriate

facilities by December 31, 2004. (Required by section 401(b) of EO 13148. Must be completed by December 31, 2005.)

Suggested Actions for NASA Administrator:

- The Administrator of NASA is responsible for ensuring that NASA meets the goals and requirements of this executive order. The Administrator delegates some of his authority to the Environmental Management Division, but he also has an important role to play as the head of NASA. The Administrator must continue to set the tone for the environmental management program at NASA and ensure that environmental considerations are an integral part of all NASA activities. The Administrator can do this by participating in the review of environmental programs, ensuring that sufficient resources are dedicated to environmental management, issuing environmental policy statements, and recognizing outstanding achievements in environmental management.

Suggested Actions for NASA HQ Codes:

-

Suggested Actions for NASA Center Environmental Managers:

- ***Select the NASA EMS Protocol*** –NASA has chosen the ISO 14001 standard as a foundation for the NASA EMS protocol and worked with the NASA Center Environmental Managers to prepare a standard set of categories and review criteria for NASA's EMS. The goal is to establish minimum Agency-wide requirements allowing Centers to address Center-specific requirements. EO 13148 requirements not addressed by ISO 14001, such as environmental compliance reviews, will be added. An ISO 14001 gap analysis was performed at each NASA Center and Component Facility (except JPL) in 1998, which concluded that NASA is already accomplishing over 80% of the activities required for an EMS. A draft NASA Procedures and Guidelines, *NASA Environmental Management (EMS) Procedures Manual*, currently exists, has been reviewed by the EMB, and should be out for formal Agency-wide review by June 2001. Selection of a standard protocol does not preclude the adoption of facility-specific goals. For example, NASA Ames may apply a higher priority to water conservation goals than NASA Langley. The process through which each Center measures progress toward its goals is standardized, not the goals or priorities themselves.

    - ***Select a NASA Center for an EMS Pilot Project*** – Pilot programs are ongoing at several Centers (Glenn, Johnson and Stennis). Environmental Functional Reviews (EFR) (which contains EMR elements) have been performed at all three sites. (Required by section 401(b) of EO 13148. Must be completed by April 21, 2002.)

    - ***Implement EMS at All NASA Facilities*** – The other Centers will need to implement an EMS by the end of 2005. The Environmental Management Division has prepared a standard approach for conducting EMRs and implementing findings so that the process can be conducted at every NASA facility. Many NASA Centers participated in the HQ sponsored ISO 14001 gap analysis study.

Other Centers have conducted their own self-assessments under the CEMP. One Center has had an EPA sponsored EMR. Although most Centers have had some experience with EMS self-assessments, many of the Centers show that improvements to their EMS could be made. The Environmental Management Division should assist every NASA facility with the implementation of EMSs. In most cases, Center environmental offices will need to work with other offices at their Center to achieve success. The Environmental Management Division can help make participation in a Center's EMS a priority. Ideally, the Centers should complete the facility-level EMRs before preparing updates to facility pollution prevention plans. (Required by section 401(b) of EO 13148. Must be completed by December 31, 2005.)

- ***Integrate EMR Findings into Facility Pollution Prevention Plans*** – A successful EMS requires a well-documented plan. NASA Centers should integrate the appropriate findings and results of EMRs and Environmental Functional Reviews into the facility pollution prevention plan. The facility pollution prevention plan should already describe many of the essential elements of an EMS, and the use of the pollution prevention plan eliminates the unnecessary duplication of effort that would accompany preparation of a separate EMS plan. [Please see Goal 3 for further discussion of Pollution Prevention Plan.]

Goal 2. Establish and Implement Environmental Compliance Audit Programs

Section	Primary Responsibility	Other Responsible Organizations
202	*HQ Environmental Management Division*	*NASA Center Environmental Managers*

Suggested Actions for HQ Environmental Management Division:

- ***Prepare the NASA Environmental Compliance Audit Protocol*** – NASA has chosen the US Army CERL protocols for the environmental compliance review portion of its environmental functional reviews. The major purposes of the Environmental Functional Review (EPR) are to: provide visibility of Center Environmental Programs within the Center and with HQ; and to meet GAO, IG, EPA, and Presidential directives regarding environmental management systems and regulatory compliance. All Centers are reviewed on a 3-year cycle. The compliance audit protocol should include checklists of environmental regulatory requirements and elements from all the *Greening the Government* Executive Orders, such as energy conservation, water conservation, recycling, and alternative fuel vehicle use. The protocol should also measure compliance with the toxic chemical reduction goals of EO 13148. (Required by section 402(a) of EO 13148. Must be completed by April 21, 2001.)

- ***Prepare a Summary of NASA Center Environmental Audit Findings*** – After the completion of audits at NASA Centers, the Environmental Management Division should collect the findings from the audits and prepare a summary report. The HQ

Environmental Management Division would use the report for budgeting and planning purposes to identify common problems and determine if NASA-wide solutions would reduce non-compliance. Additional analysis should be performed which will identify such data points as recurring compliance citations and compliance through pollution prevention projects. The HQ Environmental Management Division may also choose to establish a goal for reducing findings at Centers.

Suggested Actions for NASA Center Environmental Managers:

- ***Prepare the NASA Environmental Compliance Audit Protocol*** – NASA has chosen the US Army CERL protocols for the environmental compliance review portion of its environmental functional reviews. Center environmental managers and the Environmental Management Division should determine who will conduct compliance audits, the frequency of audits, and whether the protocol will address other issues such as occupational health and safety. The compliance audit protocol should include checklists of environmental regulatory requirements and elements from all the *Greening the Government* Executive Orders, such as energy conservation, water conservation, recycling, and alternative fuel vehicle use. The protocol should also measure compliance with the toxic chemical reduction goals of EO 13148. (Required by section 402(a) of EO 13148. Must be completed by April 21, 2001.)

- ***Conduct Environmental Compliance Audits*** – Each NASA Center must conduct environmental compliance audits every three years, in accordance with the NASA environmental compliance audit protocol. Each compliance finding should be accompanied by a solution to remedy the finding. The results of the compliance audits should be addressed systematically through formal documentation and review procedures. Center environmental managers should present the results of compliance audits to senior leadership and identify actions required of senior leaders to address non-compliance. Center environmental managers should identify specific actions that will resolve non-compliance findings using pollution prevention techniques. These actions should be incorporated into Center pollution prevention plans. (Required by sections 402(a), 402(c), and 402(e). Initial audits must be conducted by October 21, 2001 or six months after adoption of the revised audit protocol, whichever comes first.)

Goal 3. Revise Pollution Prevention Plans

Section	Primary Responsibility	Other Responsible Organizations
305(b)	*NASA Center Environmental Managers*	*HQ Environmental Management Division*

Suggested Actions for NASA Center Environmental Managers:

- ***Revise Pollution Prevention Plans*** – NASA Centers should revise their pollution prevention (P2) plans. The facility pollution prevention plan should integrate the findings and results of EMRs, including management commitment, communication procedures, formal documentation of environmental practices, and resources available for EMS implementation. These elements change the tone of the pollution prevention

plan from a technical, project-based document to a document focused on cooperation and process. The pollution prevention plan can also serve to address implementation of other environmental programs. For example, the updates to the facility pollution prevention plans required by EO 13148 should also consider energy conservation (EO 13123), water conservation (EO 13123), affirmative procurement (EO 13101), recycling (EO 13101), and alternative fuel vehicles (EO 13149). A comprehensive EMS will include action plans for implementing each of those programs. **Appendix C** contains a discussion of the changes that NASA Centers will need to make to integrate EMS concepts into the existing plans listed by facility. **Appendix D** presents a sample template of a pollution prevention plan that NASA facilities may use to help update their plans. A more detailed outline will be available on the NASA HQ Code JE webpage in June 2001, during a P2 plan revision pilot project taking place at Johnson Space Center. (Required by section 305(b) of EO 13148. Must be completed by March 31, 2002.)

Suggested Actions for HQ Environmental Management Division:

- Provide a P2 plan outline that meets the requirements of EO 13148 (and other Greening the Government EOs) to serve as a guide for NASA Centers in revising their P2 plans. A P2 plan revision pilot project will take place at Johnson Space Center beginning in April 2001. A detailed outline will be available on the NASA HQ Code JE website by June 2001.

- Provide additional P2 plan guidance and/or assistance at Center request.

Goal 4. Report NASA Center Activities Under EPCRA

Section	Primary Responsibility	Other Responsible Organizations
203	*NASA Center Environmental Managers*	*HQ Environmental Management Division*

Suggested Actions for NASA Center Environmental Managers:

- ***File TRI Form R Under EPCRA Section 313 As Applicable*** – NASA Center environmental managers are currently reporting releases and transfers of toxic chemicals using the Emergency Planning and Community Right-to-Know Act (EPCRA) Section 313 Toxic Release Inventory (TRI) Form R. EO 13148 calls for compliance with EPCRA without regard to the facility's Standard Industrial Classification (SIC) Code. Some federal facilities did not consider EPCRA applicable because they were not in the SIC Codes listed in the Act. EO 13148 requires all federal facilities that meet the threshold requirements for TRI reporting to file the Form R. The order also specifies that such reporting should be done electronically. Facilities must also report waste minimization activities in accordance with section 6607 of the Pollution Prevention Act. All NASA facilities that exceed threshold levels for TRI chemicals are currently reporting, so this action will require no change to current practices. (Required by section 501(a) of EO 13148.)

- ***Comply with Sections 301 through 312 of EPCRA*** – NASA Centers are currently in compliance with this requirement. Sections 301 through 312 require facilities to make material safety data sheets (MSDSs) available to local emergency planning committees so that they may prepare for emergencies. These sections of EPCRA also require facilities to prepare rough estimates of the amount of toxic chemicals stored through a process known as Tier I and Tier II reporting. NASA Centers already meet this requirement so this action will require no change to current practices. (Required by section 504 of EO 13148.)

- ***Participate in EPA Pilot Project on Environmental Response and Restoration*** – EPA will conduct a study of environmental response and restoration activities at federal facilities to determine if these activities result in significant releases or transfers of toxic chemicals. EPA is targeting facilities that do not currently report under section 313 of EPCRA. A NASA Center interested in demonstrating environmental leadership should volunteer for this program. The program will require Center environmental managers to collect data on spills, restoration projects, and other nonrecurring activities and report that information to EPA. In the process, the Center environmental manager will gain insight into the environmental performance of the facility and that insight may lead to improvements in the Center's EMS. (Suggested by section 501(e) of EO 13148.)

- ***Establish Process for Community Outreach*** – The purpose of EPCRA is to give local communities information about the toxic chemicals that they may be exposed from an accidental release. Inherent in this purpose is the need to develop good communication practices between facilities and the surrounding communities. NASA Centers should establish formal processes to communicate NASA's activities to local communities. This process will encourage emergency preparedness and enhance public relations. Centers may decide to hold "town hall" meetings with the Center director, have "open house" days to allow the public to tour the facility, or conduct environmental celebrations or activities to raise environmental awareness. EO 13148 requires facilities to make plans and strategies developed for the order available to the public. Centers may choose to accomplish this by providing copies to the public on request, place copies in local libraries or local government offices, or publish the plans in an electronic format on the Internet. (Required by section 903 of EO 13148.)

Suggested Actions for HQ Environmental Management Division:

- ***Community Outreach*** The Environmental Management Division can extract data from its environmental tracking software, NETS, for information on Form R filings, etc. The Environmental Management Division is prepared to answer questions from communities, if asked, and to assist the Centers, should they request assistance. –The HQ Environmental Management Division must also make available any NASA-wide strategies and plans developed for EO 13148. The most practical way to make these plans available would be to publish them in an electronic format on the Internet. (Required by section 903 of EO 13148.)

Goal 5. Reduce TRI Releases and Off-Site Transfers

Section	Primary Responsibility	Other Responsible Organizations
204	*NASA Center Environmental Managers*	*HQ Environmental Management Division*

EO 13148 requires NASA to reduce the release and off-site transfer of TRI chemicals. The EO calls for a 10 percent annual reduction or a 40 percent overall reduction by December 31, 2006. The reduction baseline is the aggregate of all releases and off-site transfers reported by NASA Centers for calendar year 2001 (based upon a list provided by EPA in December 2000).

Suggested Actions for NASA Center Environmental Managers:

- ***Reduce TRI Releases and Transfers*** –The first year for meeting annual reduction goals is calendar year 2002, which means that Centers must begin reduction efforts before having a clear idea of the baseline (calendar year 2001). The reduction goal must be met by changing practices at the NASA Centers that currently report TRI Form R and Centers which may not currently report TRI Form R, but may meet a threshold for a new chemical on the December 2000 list. Fortunately, this can be done without baseline data. NASA Centers have already conducted extensive assessments of processes that use TRI chemicals for reduction opportunities. In some cases, Center environmental managers conducted those assessments and in other cases, process managers or contractors were involved. The key to successful implementation of reduction opportunities is the involvement of the process owners. This means that the primary job of the Center environmental managers will be to encourage the active participation of project managers, Institutional Program Offices, and Center directors. Project managers and technical experts can identify process changes and evaluate the potential of each opportunity for success. Institutional Program Offices can effect long-term change to programs and obtain funding for major modifications if needed. The Center director can send the message to all Center personnel that reducing TRI releases is important. (Required by section 502(a) of EO 13148.)

Suggested Actions for HQ Environmental Management Division:

- ***Establish NASA Goal for Reduction of TRI Releases and Transfers*** –NASA Centers currently report releases and transfers of toxic chemicals using the TRI Form R. To prepare the goal, the Environmental Management Division should use the calendar year 2001 Form R filings from all NASA Centers that report and calculate an aggregate number for NASA. The calendar year 2001 report is not submitted until July of 2002, so accurate data will not be available until then. This does not preclude NASA from adopting a goal prior to 2002. The Environmental Management Division should meet with Center environmental managers to establish NASA's commitment to reducing TRI releases and transfers and prepare a NASA-specific version of the goal. The Environmental Management Division should obtain the endorsement of senior leadership at each NASA Center and at Headquarters. The final version of the

goal should be incorporated into the NASA environmental management strategy and the GPRA strategy and annual performance plan. (Required by section 502(a) of EO 13148.)

- ***Reduce TRI Releases and Transfers*** – The establishment of the reduction goal described above is only the first step toward reducing TRI releases and transfers from NASA facilities. NASA will determine its baseline from TRI data collected by NASA Centers for calendar year 2001, but this data will not be available until the summer of 2002. The role of Environmental Management Division in achieving reductions in TRI releases and transfers is to encourage the transfer of knowledge from Center to Center and to obtain the necessary commitment to reduction from senior leadership. NASA may be able to apply the management practices and technologies that will reduce TRI releases and transfers at more than one Center. In those instances, the Environmental Management Division should encourage the exchange of information. The Environmental Management Division can accomplish this by obtaining regular updates from Centers and distributing success stories and lessons learned to other Centers in the form of a website or meeting. The Environmental Management Division can also assist Centers by obtaining the commitment of NASA HQ to meet reduction goals. This commitment will allow Centers to allocate resources and assign a higher priority to the identification and implementation of reduction opportunities. The Environmental Management Division should encourage the use of life cycle assessment and environmental cost accounting to emphasize projects with longer-term paybacks or with savings that may not currently be recognized. (Required by section 502(a) of EO 13148.)

Goal 6. Reduce Use of Toxic Chemicals, Hazardous Substances, and Other Pollutants (AKA Priority Chemicals)

Section	Primary Responsibility	Other Responsible Organizations
205	*HQ Environmental Management Division*	*NASA Center Environmental Managers*

Suggested Actions for HQ Environmental Management Division:

- ***Establish NASA Goal for Reduction of Use of Priority Chemicals*** – Establishing a goal for reduction of the use of toxic chemicals as called for by EO 13148 will be considerably more difficult than the goal for reducing TRI releases and transfers. The TRI goal already uses a set list of chemicals, but the "use" reduction goal does not yet have a set list of chemicals. EPA and the Interagency Workgroup will select the 15 chemicals and associated processes targeted for reduction by this goal. After the Workgroup establishes the list, the Environmental Management Division must determine if NASA Centers use five or more of the chemicals on the list at levels over the threshold set by the Workgroup. If NASA Centers do not use five of the chemicals, NASA must develop its own list of five chemicals for reduction. NASA may choose to do this anyway according to the provisions of section 503(d) of the executive order. NASA would create such a list by soliciting proposals from the

Centers, using data generated from NETS, and working with the JG-PP staff. If NASA chooses to adopt the list of 15 chemicals from the Workgroup, NASA must develop a goal for reduction. The baseline year will be the first calendar year following the development of the list. That will most likely be calendar year 2001, although it could be 2002. In either case, NASA must reduce use of the priority chemicals by 50 percent by December 31, 2006. The Environmental Management Division should meet with Center environmental managers to establish NASA's commitment to reducing the use of the priority chemicals and prepare a NASA-specific version of the goal. The Environmental Management Division should obtain the endorsement of senior leadership at each NASA Center and at Headquarters. The final version of the goal should be incorporated into the NASA environmental management strategy and the GPRA strategy and annual performance plan. (Required by section 503(a) of EO 13148.)

- ***Reduce Use of Priority Chemicals*** – Achieving reductions in use of the priority chemicals identified by the Interagency Workgroup will require a process similar to that used for reducing TRI releases and transfers. The role of the Environmental Management Division in achieving reductions in use of priority chemicals is to encourage transfer of knowledge from Center to Center and to obtain the necessary commitment to reduction from senior leadership. NASA may be able to apply the management practices and technologies that will reduce usage at more than one Center. In those instances, the Environmental Management Division should encourage the exchange of information. The Environmental Management Division can accomplish this by obtaining regular updates from Centers and distributing success stories and lessons learned to other Centers in the form of a website or meeting. The Environmental Management Division can also assist Centers by obtaining the commitment of NASA HQ to meet reduction goals. This commitment will allow Centers to allocate resources and assign a higher priority to the identification and implementation of reduction opportunities. The HQ Environmental Management Division should encourage the use of life cycle assessment and environmental cost accounting to emphasize projects with longer-term paybacks or with savings that may not currently be recognized. (Required by section 502(a) of EO 13148.)

- ***Undertake Pilot Projects to Collect Data on Toxic Chemical Use*** – Prior to the determination of the list of priority chemicals, The HQ Environmental Management Division should solicit NASA Centers for a volunteer to undertake a pilot project on toxic chemical use reduction. This pilot project will allow NASA to develop materials accounting practices that can be applied when the Workgroup establishes the list of priority chemicals. The pilot project would require the Center environmental manager to work with the process owners to conduct inventories of materials used and establish tracking mechanisms to document actual material usage. These mechanisms may include physical inventories, material usage logs, computer databases, and engineering estimates. The purpose of the pilot project should be to develop standard approaches to data collection so that all NASA Centers will use the

same procedures and so that The HQ Environmental Management Division may easily aggregate data. (Required by section 503(f) of EO 13148.)

- ***Determine the Feasibility of Implementing Centralized Hazardous Material Distribution Systems*** – Most NASA Centers currently use some form of centralized hazardous material distribution systems, also known as "hazardous material pharmacies". Many Centers use these systems to track hazardous material use but not to target reduction opportunities or substitutions. Some Centers have hazardous material management systems, but do not apply centralized tracking or control of distribution. The Environmental Management Division should conduct a study of all NASA Centers to identify successful techniques for operation of hazardous material pharmacies and determine if the Centers could expand existing pharmacies. Some hazardous material pharmacies do not include all users of hazardous materials such as contractors or tenant activities. The study should attempt to explain the barriers to implementing hazardous material pharmacies throughout NASA and identify the resources required to achieve this goal. (Required by section 701(b) of EO 13148. Must be completed by April 21, 2002.)

- ***Revise Standards and Specifications to Eliminate or Reduce the Use of Priority Chemicals*** – After the Workgroup identifies the 15 priority chemicals and associated processes for reduction, the Environmental Management Division should work with other NASA HQ offices to ensure that those offices revise specifications under their control. The revisions should call for the elimination or reduction of the use of priority chemicals and should identify suitable substitutes. The offices most likely to be affected include Procurement (Code H) the Institutional Program Offices, and the Enterprises. The Environmental Management Division can assist in this process by working with JG-PP, EPA, DoD, and GSA to identify substitutes. Any substitutes identified in this manner would still require review and approval by the appropriate NASA office. (Required by section 701(c) of EO 13148. Completed following established schedules for review of documents.)

Suggested Actions for NASA Center Environmental Managers:

- ***Reduce Use of Toxic Chemicals*** – NASA Centers will have to change current practices to meet the reduction goal for the use of toxic chemicals. The process for identifying and implementing changes closely parallels the process described for the reduction goal for TRI releases and transfers. NASA Centers have already conducted extensive assessments of processes that use toxic chemicals for reduction opportunities. In some cases, Center environmental managers conducted those assessments and in other cases, process managers or contractors were involved. The key to successful implementation of reduction opportunities is the involvement of the process owners. This means that the primary job of the Center environmental managers will be to encourage the active participation of project managers, Institutional Program Offices, and Center directors. Project managers and technical experts can identify process changes and evaluate the potential of each opportunity for success. Institutional Program Offices can effect long-term change to programs

and obtain funding for major modifications if needed. The Center director can send the message to all Center personnel that reducing the use of toxic chemicals is important. If toxic chemical use reduction is not a high priority at the Center, reaching the goal will be very difficult. (Required by section 503(a) of EO 13148.)

- ***Undertake Pilot Projects to Collect Data on Toxic Chemical Use*** – NASA Centers may choose to participate in a pilot project on toxic chemical use reduction. The purpose of the pilot project is to develop materials accounting procedures so that all NASA Centers will produce data in a similar format. This will allow The Environmental Management Division to aggregate data easily. The Center will benefit from having started the process of toxic use reduction earlier than other Centers. The Center can also demonstrate environmental leadership by sponsoring a pilot project. The pilot project would require the Center environmental manager to work with the process owners to conduct inventories of materials used and establish tracking mechanisms to document actual material usage. These mechanisms may include physical inventories, material usage logs, computer databases, and engineering estimates. (Required by section 503(f) of EO 13148.)

- ***Determine the Feasibility of Implementing Centralized Hazardous Material Distribution Systems*** – Most NASA Centers currently use some form of centralized hazardous material distribution systems, also known as "hazardous material pharmacies". Many Centers use these systems to track hazardous material use but not to target reduction opportunities or substitutions. Some Centers have hazardous material management systems, but do not apply centralized tracking or control of distribution. The Center environmental managers should determine if implementing a comprehensive centralized hazardous material distribution system is feasible. The environmental manager should identify the barriers to implementing hazardous material pharmacies at the Center and identify the resources required to achieve this goal. The environmental manager should report the results of this review to HQ Environmental Management Division. (Required by section 701(b) of EO 13148. Must be completed by April 21, 2002.)

Goal 7. Develop a Plan to Phase Out the Procurement of Ozone Depleting Substances

Section	Primary Responsibility	Other Responsible Organizations
206	*HQ Environmental Management Division*	*NASA Center Environmental Managers* *Institutional Program Offices*

Suggested Actions for HQ Environmental Management Division:

- ***Develop Plan to Phase Out Ozone Depleting Substances*** – NASA facilities have made significant progress in the reduction of the use of ozone depleting substances (ODSs) in the past few years. Many NASA Centers still use Class I ODSs in processes related to their missions. Several Centers also use Class I ODSs in

facilities and equipment for HVAC systems. The first step in preparing a plan for the complete phase out of the procurement of ODS will be to collect current information on usage at NASA Centers. The Environmental Management Division has collected data previously, but most of this data is from FY 1997 or FY 1998. The Environmental Management Division should collect information on the type of ODS used, locations and processes where the ODS is used, and the process owner. The Environmental Management Division should use the data collection activity as an opportunity to inform NASA Centers of the plan to phase out ODS. Most Centers are aware of the deadline for phasing out procurement of Class I ODS, but they have not established programs for achieving phase out. Several Centers have noted that the processes that require use of ODS are not under the control of the Center's facility managers. The Environmental Management Division will need to involve process owners, Institutional Program Offices, and headquarters personnel. This cross-functional group will be able to identify barriers to phasing out ODS and recommend actions to overcome those barriers. After meeting with process owners and Center environmental managers, the Environmental Management Division should prepare a plan for phase out. The plan should be reviewed by process owners and approved by the Administrator. The plan should include information on the EPA Significant New Alternatives Program (SNAP). The plan should also establish procedures for disposing of ODS through the Department of Defense as discussed in section 505(c) of EO 13148. (Required by section 505(b) of EO 13148. Must be completed by April 21, 2001.)

- ***Implement ODS Reduction Plan*** – The Environmental Management Division must provide assistance to NASA Centers to achieve the complete phase out of ODS. The use of ODS in mission critical activities and in activities beyond the control of Center environmental managers will require the participation of Institutional Program Offices and representatives from the Enterprises. The Environmental Management Division has funded several studies in the past to reduce or eliminate the use of ODS from NASA Centers. Although many of these studies yielded significant reductions, achieving additional reductions or elimination will require participation from all organizations involved in the use of ODS. The Environmental Management Division is in a position to assist in building teams made up of representatives from different organizations. Similarly, the Environmental Management Division can encourage participation of technical experts from other Centers to review processes that use ODS.

- ***Revise Standards and Specifications to Eliminate the Use of ODSs*** – In some cases, NASA may need to revise standards and specifications to allow for the elimination of a Class I ODS. The Environmental Management Division should work with other NASA HQ offices to ensure that those offices revise specifications under their control. The revisions should call for the elimination of the use of Class I ODS and should identify suitable substitutes. The offices most likely to be affected include Procurement (Code H) the Institutional Program Offices, and the Enterprises. Environmental Management Division can assist in this process by working with JG-

PP, EPA, DoD, and GSA to identify substitutes. Any substitutes identified in this manner would still require review and approval by the appropriate NASA office.

Suggested Actions for NASA Center Environmental Managers:

- ***Collect Data on ODS Use*** – Some NASA Centers currently collect information on ODS usage across the facility for TRI reporting purposes. This data does not include information about the processes where ODSs are used or about the process owners. If NASA Center environmental managers begin to collect more detailed information on ODS usage, this helps to notify process owners that the usage of these substances is being phased out. The Center environmental manager should note those cases where ODS usage is required by specifications or in a mission essential activity. The Center environmental manager should identify the owner of the specification or process. The environmental manager should send this information to the Environmental Management Division so that the Environmental Management Division may determine if similar usage is occurring at other Centers. This will help avoid duplication of effort. For situations in which ODSs are being used in HVAC equipment or in facilities that are not governed by a NASA specification, the Center environmental manager should determine if the Center facility manager has prepared a schedule for replacement of the equipment that will meet the phase out deadline. Centers should only replace equipment on a regular schedule after the useful life of the equipment is over. The Center environmental manager or facility manager should conduct an economic analysis to determine if there is an overall reduction in life cycle cost if the equipment is replaced before the end of its useful life.

- ***Identify Opportunities for Elimination of ODSs*** – Center environmental managers should use the information collected in the action described above to identify opportunities to eliminate ODSs from NASA Centers. Many Centers have conducted opportunity assessments previously and achieved significant reductions in usage as a result. Environmental Management Division should collect these success stories and distribute them to other Centers. If Centers have implemented projects to reduce ODS usage but have not completely eliminated usage, then additional study may be required. The key to identifying successful opportunities is to include the process owners in the assessment. Without the participation of process owners, eliminating usage of ODSs will be difficult. Center environmental managers may want to include outside experts in ODS reduction such as technical representatives from equipment contractors or EPA SNAP personnel.

Goal 8. Implement Environmentally Sound Landscaping Practices

Section	Primary Responsibility	Other Responsible Organizations
207	*HQ Environmental Management Division*	*NASA Center Environmental Managers*

Suggested Actions for HQ Environmental Management Division:

- ***Promote Implementation of Environmentally Sound Landscaping Practices*** – Most NASA Centers currently employ environmentally sound landscaping practices. Almost all NASA facilities use native plants for landscaping and employ water and energy conservation practices through the use of efficient irrigation, plant siting, and mulching. Although many NASA Centers are using environmentally sound landscaping practices, many Center environmental managers indicated that they had very little interaction with facility landscaping personnel. The Environmental Management Division can facilitate comprehensive implementation of environmentally sound landscaping practices at NASA Centers by organizing informal meetings between facility landscaping personnel and environmental personnel. These meetings will allow both parties to understand the requirements of the other and to help identify opportunities for further improvement. In some cases, use of environmentally sound landscaping practices may not be economically viable, and Center environmental managers can document this fact by working with landscaping personnel to identify the total costs of implementation. (Required by section 207 of EO 13148, no due date.)

Suggested Actions for NASA Center Environmental Managers:

- ***Identify and Implement Environmentally Sound Landscaping Practices*** – Most NASA Centers already employ some of the practices suggested in the Presidential Memorandum on Environmentally Sound Landscape Management (Federal Register Volume 60, Number 154, Pages 40837-40841), dated August 10, 1995. Center environmental managers should review the list of suggested practices and identify practices that may be applicable to their facilities. The Center environmental manager should conduct research on vendors that can provide equipment or services to implement those practices. Environmental managers should conduct life cycle cost analyses to determine if a given project is economically viable. Center environmental managers should work with local landscaping personnel and the facility manager to identify the roles and responsibilities of those involved.

- ***Conduct Demonstration Projects*** – NASA Centers can encourage the adoption of environmentally sound landscaping practices by implementing demonstration projects. In some cases, projects with economic benefits, such as use of reclaimed water for irrigation may not be pursued because of the perception of unsanitary conditions or significant capital costs. Center environmental managers can provide information on environmental and health regulations and the total cost of projects to help defuse these arguments. .

Goal 9. Comply with E.O. 13148 Requirements and Note E.O. 13148 Recommendations

Sections	Primary Responsibility	Other Responsible Organizations
Various	*HQ Environmental Management Division*	*NASA Center Environmental Managers*

Suggested Actions for HQ Environmental Management Division:

- ***Prepare a NASA Environmental Management Strategy*** – After conducting the HQ EMR, NASA should prepare an environmental management strategy that addresses the specific steps required to implement EO 13148. The strategy will be a written document to provide a schedule for implementation, identify key participants, and determine the resources required to implement the EO. This document will contain the actions listed in this guide as well as other actions identified from the EMR. The strategy should be prepared by Environmental Management Division, but reviewed and signed by the Administrator to establish its importance to NASA. This document, *NASA Guidance to Implement EO 13148,* is intended to be a starting point in the development of a NASA environmental management strategy. **Appendix B** contains a more detailed outline of the strategy. (Required by section 305(a) of EO 13148. Must be completed by April 21, 2001.)

- ***Incorporate Goals of EO 13148 into Existing NASA Policies*** – The purpose of EO 13148 is to integrate environmental accountability into day-to-day operations at federal agencies. This will require Environmental Management Division to review existing policies and practices to determine how NASA takes environmental considerations into account. The Environmental Management Division should work with other offices at NASA HQ to encourage the use of environmental criteria in decision making. The Environmental Management Division will interact with these offices primarily through participation in the normal process of policy modification and review.[4] Other examples of environmental policy changes are given below. (Required by section 305(a) of EO 13148. Must be completed by April 21, 2001.)

- ***Establish Environmental Funding Policy Consistent with EO 13148*** – EO 13148 calls for agencies to emphasize the use of pollution prevention to address environmental compliance. To implement this practice, NASA must abandon the use of the A-106(?) process for environmental funding. Current funding practices encourage Centers to maintain compliance through the operation and maintenance of existing pollution control systems. By adopting pollution prevention, NASA Centers will still be responsible for maintaining compliance, but compliance projects will no

[4] Offices that will be involved in an EMS include the Administrator (Code A), the Chief Financial Officer (Code B), Human Resources and Education (Code F), Management Systems and Facilities (Code J), Safety and Mission Assurance (Code Q), Policy and Plans (Code Z) and the Enterprises. For examples of the types of interactions Environmental Management Division will have with these offices, see Appendix A, *Participation in Functional Office Initiatives.*

longer receive funding priority. Instead, pollution prevention projects will be funded preferentially. Current funding practices discourage the use of capital investment to upgrade infrastructure or address systemic environmental issues. This change in budgeting procedure will require Centers to conduct life cycle assessments of environmental processes and develop long-range plans for addressing environmental compliance. (Required by section 301 and 303 of EO 13148, no due dates.)

- ***Conduct a Pilot Program on Life Cycle Assessment and Environmental Cost Accounting*** – Many NASA Centers would benefit from the application of life cycle assessment and environmental cost accounting principles in the environmental decision making process. Some Centers are currently using limited life cycle cost analyses or environmental cost accounting. Environmental Management Division should solicit the Centers for a volunteer to sponsor a pilot program. The Center's environmental office would conduct a thorough review of its environmental operations and identify hidden and intangible costs and benefits. Another important step in this pilot program would be to assign environmental and energy costs directly to the source of the cost. Many Centers pay for environmental and energy costs from overhead budgets, which results in a disincentive for NASA managers to reduce these costs. The product of the pilot program would be a summary of the findings with recommendations for making the use of these principles permanent. Environmental Management Division would adapt the pilot program for implementation at all NASA Centers. (Required by section 302 of EO 13148; no due date.)

- ***Incorporate Revised Acquisition Procedures into NASA Contracts*** – EO 13148 calls for the Federal Acquisition Regulation Council to develop policies and procedures that will require contractors to provide necessary information for compliance with the order. The executive order does not provide a deadline for the review and development of appropriate policies, but NASA should anticipate that these changes will be in place in two or three years. Many NASA support contracts have implications for the implementation of the executive order and will require contract clauses or modifications. Environmental Management Division should work with NASA contracting officers to develop a plan for incorporating the new policies into NASA contracts. This may involve training contracting officers on the requirements of EO 13148 and working on acquisition procedures that are specific to NASA. (Implementation of training programs to ensure that agency procurement officials and acquisition program managers are aware of EO requirements and applicability to them is required by section 701(a) of EO 13148. Must be completed by April 21, 2001.)

- ***Participate in the Interagency Environmental Leadership Workgroup*** – EPA will convene a workgroup to develop policies and guidance for EO 13148. NASA's representative for the workgroup comes from the Environmental Management Division and coordinates the activities of the workgroup with internal NASA policies and guidance. This may include coordinating with the implementation of other *Greening the Government* Executive Orders, such as EO 13101 and EO 13123. The NASA representative should look for opportunities for overlaps in planning and

policies between the executive orders. (Required by section 306 of EO 13148. Workgroup convenes by August 21, 2000.)

- ***Submit an Annual Progress Report to EPA*** –The NASA Environmental Management Division should prepare the annual progress report to EPA on implementation of this executive order. EPA has issued guidance on the format and content of the report. The types of information that NASA should include in the report are a summary of the environmental management strategy, actions taken from the strategy, and copies of implementation schedules. The Environmental Management Division should also include specific examples from NASA Centers that demonstrate implementation of the executive order. The plan should be reviewed by the Administrator and submitted under his signature. (Required by section 307 of EO 13148. First report will cover calendar year 2000, EPA determined March 1, 2001 as first due date.)

- ***Develop a NASA Environmental Leadership Award Program*** – Environmental Management Division should work with the Administrator to establish an Environmental Leadership Award Program. The program should recognize outstanding achievements by individuals and groups in the implementation of EO 13148. The Environmental Management Division may choose to develop this award program as a part of a larger award program that covers all of the *Greening the Government* Executive Orders. The Environmental Management Division should solicit nominations from all NASA facilities. The Interagency Environmental Leadership Workgroup has prepared guidance on criteria for Closing the Circle (CTC) awards in this program. Categories include: Pollution Prevention; EMS; LCA/ECA; and Education and Outreach. (Required by section 403(b) of EO 13148, section 406(a) of EO 13123, section 802 of EO 13101, and section 303(a) of EO 13149.)

- ***Develop and Conduct Training for Senior NASA Leadership on Greening the Government*** – The active participation of senior leadership in environmental management is essential to the success of an EMS. The Environmental Management Division should coordinate with any training materials which EPA, through the EO 13148 Workgroup, might prepare and/or prepare brief, specific, student-centered training materials that can be incorporated into existing senior level management training. The training should cover all aspects of the four *Greening the Government* Executive Orders. The Environmental Management Division should work closely with senior leadership during the development of the materials to ensure that the materials are appropriate in tone and level of detail. The Environmental Management Division should prepare the materials so that they present information from the viewpoint of senior leadership on a "need to know" basis. Senior leaders should receive specific information on how they can best support NASA's EMS. The Environmental Management Division should coordinate this effort with Human Resources and Education (Code F) to ensure that the proper training formats and procedures are used. (Required by section 404(a) of EO 13148, section 801(b) of EO 13101, and section 406(d) of EO 13123.)

- ***Develop and Conduct Training for Personnel Involved in Environmental Management*** – The Environmental Management Division should develop training materials specific to the job and required level of knowledge for all appropriate NASA HQ and facility personnel. This should include environmental managers, project and program managers, procurement personnel, contracting personnel, contractors, hazardous material handlers, and others. Training this diverse group of personnel will require development of student-centered materials that communicate only the relevant concepts to the intended audience. In practice, this may require preparing and delivering several distinct training courses. The Environmental Management Division should coordinate this effort with Human Resources and Education (Code F) to ensure that the proper training formats and procedures are used. Delivery of training courses at NASA Centers may be delegated to Center environmental managers. NASA should also consider using distance-based learning where appropriate to reduce costs and enhance standardization of content. (Required by sections 404(a) and 701(a) of EO 13148, section 801(b) of EO 13101, and section 406(d) of EO 13123.)

- ***Incorporate Environmental Management Criteria into Position Descriptions and Performance Evaluations*** – NASA personnel must receive a clear signal that environmental management is important. NASA can accomplish this by including environmental management criteria in position descriptions and performance evaluations for relevant personnel. This will include senior leadership, environmental managers, project and program managers, procurement personnel, contracting personnel, contractors, hazardous material handlers, and others. Including these requirements for contractors may require modification of existing contracts. The criteria should be specific to the individual position and may or may not be a "critical" measure of performance. The Environmental Management Division should also include criteria and requirements from other *Greening the Government* Executive Orders at the same time to avoid duplication of effort. The Environmental Management Division will implement this action at the HQ level and Center environmental managers will implement this action at NASA Centers. The Environmental Management Division should coordinate this effort with Human Resources and Education (Code F) to ensure that the proper formats and procedures are used. (Required by section 404(b) of EO 13148, section 406(b) of EO 13123, and section 303(b) of EO 13149.)

- ***Incorporate NASA Environmental Leadership Goals into GPRA Plans*** – The environmental leadership goals described in the *Greening the Government* Executive Orders are consistent with the goals established in the *Strategic and Annual Performance Plans* required by the Government Performance and Results Act of 1993 (GPRA). The Environmental Management Division should coordinate with the office responsible for preparation of these plans (Code A) to ensure that environmental leadership goals are included and in the proper format. (Required by section 407 of EO 13148 and section 601(d) of EO 13101.)

Suggested Actions for NASA Center Environmental Managers:

- ***Incorporate Goals of EO 13148 into Existing NASA Policies*** – Many NASA Centers have prepared facility-specific policies for environmental management that take into account the unique characteristics of the Center. Each NASA Center should review these policies to ensure that they are consistent with EO 13148, and if they are not, revise the policies. Center environmental managers may choose to coordinate this revision process with NASA HQ Environmental Management Division to ensure consistency. Center environmental managers will also need to work with other functions at the Center to incorporate the goals of EO 13148 into non-environmental policies.[5] (Required by section 305(a) of EO 13148. Must be completed by April 21, 2001.)

- ***Conduct a Pilot Program on Life Cycle Assessment and Environmental Cost Accounting*** – Pilot programs are ongoing at several Centers and are benefiting from the application of life cycle assessment and environmental cost accounting principles in the environmental decision making process. Some Centers currently employ limited life cycle and environmental cost accounting practices. A NASA Center may elect to participate in a pilot program on life cycle assessment and environmental cost accounting. The Center's environmental office would conduct a thorough review of its environmental operations and identify hidden and intangible costs and benefits. The review would assign environmental and energy costs directly to the source of the cost. Many Centers pay for environmental and energy costs from overhead budgets, which results in a disincentive for NASA managers to reduce these costs. The product of the pilot program would be a list of specific actions to revise management practices to make the use of these principles permanent. (Required by section 302 of EO 13148.)

- ***Incorporate Revised Acquisition Procedures into NASA Contracts*** – EO 13148 calls for the Federal Acquisition Regulation Council to develop policies and procedures that will require contractors to provide necessary information for compliance with the order. The executive order does not provide a deadline for the review and development of appropriate policies, but NASA should anticipate that these changes will be in place in two or three years. Many NASA support contracts impact the implementation of the executive order and will require contract clauses or modifications. NASA Center environmental managers should work with NASA contracting officers to develop a plan for incorporating the new policies into NASA contracts.

- ***Conduct Training for Personnel Involved in Environmental Management*** – NASA is required by EO 13148 to develop and conduct training on implementation of the requirements of the order. This training may include environmental managers, project and program managers, procurement personnel, contracting personnel,

[5] Offices at Centers that will be involved in an EMS and that may require revision of policies and procedures include the Center Director, the Center Finance Office, Human Resources and Education, Management Systems and Facilities, Safety and Mission Assurance, Policy and Plans, and the Enterprises.

contractors, hazardous material handlers, and others. NASA HQ Environmental Management Division will develop the training materials, but each Center will be responsible for ensuring that the appropriate personnel receive the training. Center environmental managers should identify the target audience for the training and administer delivery of the training. Administration tasks may include registering students, teaching specific sections, soliciting feedback, and documenting attendance. Center environmental managers should coordinate this effort with Human Resources and Education to ensure that the proper training formats and procedures are used. (Required by sections 404(a) and 701(a) of EO 13148, section 801(b) of EO 13101, and section 406(d) of EO 13123.)

- ***Incorporate Environmental Management Criteria into Position Descriptions and Performance Evaluations*** – NASA personnel must receive a clear signal that environmental management is important. NASA can accomplish this by including environmental management criteria in position descriptions and performance evaluations for relevant personnel. Responsibility for implementation of this action at NASA Centers will rest with Center environmental managers and HQ(?). Personnel whose position descriptions and performance evaluations will be affected by this action include senior leadership, environmental managers, project and program managers, procurement personnel, contracting personnel, contractors, hazardous material handlers, and others. Including these requirements for contractors may require modification of existing contracts. The criteria should be specific to the individual position and may or may not be a "critical" measure of performance. NASA HQ Environmental Management Division may provide guidance on specific criteria and requirements from other *Greening the Government* Executive Orders. Center environmental managers should coordinate this effort with Human Resources and Education (Code F) to ensure that the proper formats and procedures are used. (Required by section 404(b) of EO 13148, section 406(b) of EO 13123, and section 303(b) of EO 13149.)

Appendix A: Participation in Functional Office Initiatives

The purpose of EO 13148 is to integrate environmental accountability into NASA day-to-day decision making and long-term planning processes, across all NASA missions, activities and functions. Achieving integration of environmental considerations in NASA activities will require coordination between many different organizations. Each functional office in NASA can make a contribution to this effort, with the Environmental Management Division providing guidance and administration. This appendix describes the role of key offices in NASA, their relationship to the Environmental Management Division, and the participation that Environmental Management Division can have in the initiatives sponsored by those offices.

Code A

The Administrator of NASA is responsible for ensuring that NASA meets the goals and requirements of the executive order. The Administrator delegates some of his authority to the Environmental Management Division, but he also has an important role to play as the head of NASA. The Administrator must continue to set the tone for the environmental management program at NASA and ensure that environmental considerations are an integral part of all NASA activities. The Administrator can do this by participating in the review of environmental programs, ensuring that sufficient resources are dedicated to environmental management, issuing environmental policy statements, and recognizing outstanding achievements in environmental management.

Several initiatives in Code A have environmental implications. Code AE is implementing a functional office initiative on NASA Technical Standards. The purpose of this initiative is to establish an integrated, NASA Preferred Technical Standards System for the Enterprises. This system would use voluntary consensus standards rather than the prescriptive specifications that NASA has used in the past. EO 13148 addresses the revision of specifications and standards to ensure that the standards do not require the use of toxic chemicals or ozone depleting substances. NASA can use voluntary consensus standards and prohibit the use of certain chemicals. The Environmental Management Division will work with Code AE to make sure that standards are consistent with the executive order. This does not mean that NASA will write a prescriptive specification, rather a performance-based standard can be used, but NASA must include language requiring compliance with environmental laws and executive orders.

Code AE is undertaking an initiative called “7120.5A Process Implementation” that improves Program Project Management Requirements. Many programs in NASA governed by this initiative use hazardous materials and are the owners of processes that have adverse environmental impacts. The Environmental Management Division should encourage the inclusion of environmental considerations in the Program Project Management Requirements. This could mean adopting environmental criteria as a part of measuring the performance of a project, or including life cycle costs in the financial analysis of projects.

Code AF is sponsoring an initiative to develop an Integrated Technology Plan for NASA. This initiative will provide not only the content of ongoing and planned technology activities, but also the rationale and justification in the context of NASA's future needs. The Environmental Management Division should encourage Code AF to include environmental considerations in the rationale and justification of technology activities. Many of the technology activities in the planning stages now will have environmental implications for NASA as the technologies are adopted.

NASA Code AO is implementing an initiative to contract out desktop and networking services. These services will be used throughout NASA. The Environmental Management Division should ensure that contract language reflects the requirement for using energy efficient computer equipment, in accordance with the EnergyStar program.

Code B

The Chief Financial Officer (Code B) oversees the accounting and financial management functions in NASA. Code B has several initiatives to revise financial management practices, including the Integrated Financial Management Project (IFMP), the Agency-wide Financial and Resources Management Staff Training, and the Full Cost Practices initiative. Each of these initiatives represents an opportunity for the Environmental Management Division to integrate environmental cost accounting practices into the day-to-day procedures of NASA. The Environmental Management Division should rely on the financial expertise of Code B to determine the most effective way to include environmental considerations in these initiatives, but the Environmental Management Division can review the initiatives to ensure they are consistent with EO 13148. For example, the Environmental Management Division should work with the CFO to ensure that the Full Cost Practices include environmental waste disposal, energy, environmental liability, occupational health, and other relevant categories of cost.

The CFO (Code B) is implementing NASA's GPRA program, and Environmental Management Division should make sure that the environmental goals of EO 13148 are included in GPRA reports (As required by section 407 of EO 13148). Many other offices at NASA are reviewing the GPRA performance goals and preparing annual plans. The Environmental Management Division should work with each office as appropriate to ensure that the plans and goals are consistent with EO 13148.

Code F

The Human Resources and Education office (Code F) at NASA has an important role to play in the implementation of EO 13148. The executive order requires NASA to include environmental considerations in the position descriptions and performance evaluations of relevant personnel and Code F can help Environmental Management Division implement this requirement. EO 13148 contains a requirement for training senior leadership and others on the concepts behind the executive order, and Code F can assist the Environmental Management Division with the development and delivery of this training. Using Code F to help achieve these requirements serves to integrate environmental considerations into the NASA management system.

Code H

The Procurement office (Code H) has proposed an initiative to adopt Performance Based Contracting. The Environmental Management Division should work with Procurement office personnel to ensure that the initiative includes language that allows for use of environmentally beneficial landscape management practices, affirmative procurement items, energy conservation practices, environmentally benign adhesives, monitoring of toxic chemical releases, and reduction of ozone-depleting substances.

Code H is implementing an initiative on Risk-Based Acquisition Management. The description of the initiative supplied by Code H says that the initiative will integrate risk management principles (including safety, security, health, cost, schedule, technical and unintended technical transfer) throughout the acquisition process, thereby reducing the incidence and severity of unforeseen programmatic events. The Environmental Management Division should make sure that environmental considerations are added to the list of risk management criteria.

The executive order discusses several issues related to procurement that should be the primary responsibility of Code H. These include revision of purchasing standards to reduce the use of toxic chemicals, and the adoption of restrictions on adhesives and ozone depleting substances. Code H is positioned to implement these requirements more effectively than the Environmental Management Division, although the Environmental Management Division may assist with interpretation and implementation.

Code J

The Environmental Management Division is a part of the Management Systems and Facilities Office (Code J). As the principal caretaker of NASA facilities and equipment, Code J plays a significant role in the integration of environmental considerations in operations. Code J is already incorporating environmental considerations in the Integrated Asset Management initiative and should include environmental considerations in the Logistics Management Network initiative. Logistics management is a critical part of an integrated strategy for reducing the use of toxic chemicals. The Environmental Management Division should participate in the development of this network to identify means to incorporate hazardous material pharmacy concepts into the system. Code J is sponsoring an initiative to Implement and Institutionalize Reliability-Centered Maintenance (RCM) in Agency-wide Facilities Maintenance (FM) Programs. The development of this initiative should address the life cycle costs and environmental impacts from the choice of a given maintenance program.

Code J also will act as the lead for many of the goals of the executive order. Code J oversees the operation and maintenance of equipment and facilities subject to the energy conservation and water conservation provisions of EO 13123. Code J is involved in the selection of landscape management practices and oversees the contractors that conduct day-to-day maintenance at NASA facilities. Code J should ensure that environmental considerations are included in contracts for maintenance and equipment, consistent with the Greening the Government executive orders.

Appendix B: Outline of NASA HQ Environmental Management Division's Environmental Management Strategy

Section 305(a) of EO 13148 requires NASA to develop an environmental management strategy by April 21, 2001. This strategy will describe how NASA will achieve the goals and requirements of the executive order. The main body of this report summarizes many of the goals and requirements of EO 13148 and provides some additional actions that will ease implementation of the requirements. This appendix provides a hypothetical outline of the written strategy with some discussion on how to prepare the strategy.

I. Executive Summary
II. Introduction to Executive Order 13148
III. Roles and Responsibilities
IV. Goals and Requirements
V. Performance Measures
VI. Implementation Schedule

Executive Summary

This section will provide a brief overview of the strategy with a summary of the goals and requirements. The Executive Summary should identify key participants for implementation and briefly discuss resource requirements. The main body of the strategy will provide additional details. The Executive Summary is typically written after the rest of the strategy is completed and written.

Introduction to Executive Order 13148

This section will describe the background behind the executive order and mention the other Greening the Government executive orders. The introduction should provide references to the complete text of EO 13148 and other executive orders. It should also state the purpose of the order and provide some background on environmental management systems. The first part of this implementation strategy provides most of this information.

Roles and Responsibilities

The Environmental Management Division will need to review the goals and requirements of EO 13148 and determine the appropriate key participants for implementation. In some cases, the Environmental Management Division may be the lead organization, but other offices will be more appropriate for other tasks. For example, Code H should be the lead office for implementation of changes in procurement practices and Code B should be the lead office for integrating environmental cost accounting practices into NASA financial management procedures. The Environmental Management Division will need to work closely with these offices to ensure that they understand their responsibilities. The key offices should review this section and contribute to its development so that the section accurately describes each office's contributions to the overall effort. Preparing this section of the strategy will require meetings, reviews, and discussions to determine the

best use of NASA offices. The roles and responsibilities section should be reviewed by the Administrator to make sure it is consistent with NASA's strategic plan.

Goals and Requirements

The Environmental Management Division should review the goals and requirements and make sure they are consistent with NASA policy and NASA's strategic plan. These goals will serve as a central reference for all NASA offices and should be circulated and discussed before adopting them. The Environmental Management Division can identify many areas and initiatives in other offices that should include environmental considerations in decision making, and likewise, other offices may have initiatives and requirements that will affect the decision making process of the Environmental Management Division. These goals should be included in the NASA GPRA annual report and should be reviewed by the Administrator. Preparing this section of the strategy will involve a review process similar to that described for the section on Roles and Responsibilities and it may be best to combine the efforts into a single process.

Performance Measures

The environmental management strategy will not only describe goals and requirements, but should also provide a detailed description of how to achieve the goals set forth in the strategy. The first step in providing this description is to define the performance measures that NASA will use to assess progress. For some of the goals, such as reduction in TRI chemical release and transfer, the goals will be numeric measures. For those goals, the Environmental Management Division must define how they calculate the numbers. If certain assumptions are made, the Environmental Management Division should provide them here. For example, the Environmental Management Division may assume that NASA Centers that are not currently reporting TRI Form R will not report TRI Form R in the future, reducing the number of Centers participating in the goal. Other goals and requirements will not allow the use of numeric calculations. For example, revising specifications to reflect the requirements of the executive order is a goal that is harder to represent numerically. In this case, the Environmental Management Division may choose to adopt a "performance based" approach to measure success. The Environmental Management Division could institute a review of all specifications as they are revised and this will lead NASA to the goal without actively documenting all instances of specifications that should be revised. The choice of a method for achieving the goal has very big implications on resource requirements. The Environmental Management Division should work with the Interagency Workgroup to ensure that the approach that NASA selects is consistent with the guidance set forth by the workgroup. The choice of performance measures should be included with the goals in the GPRA annual report and reviewed by the Administrator.

Implementation Schedule

The implementation schedule is a detailed chart that lists the specific actions NASA will take to implement the goals and requirements of the executive order. The chart should include the key offices responsible for implementation, a brief description of the action, other offices that may be involved, milestones for measuring progress, and the resources required to implement the actions. This section should be prepared after the sections on

Goals and Requirements, Roles and Responsibilities, and Performance Measures are completed.

The sections listed above are only suggestions for how to prepare an environmental management strategy. The Interagency Workgroup established by the executive order may issue guidance about how to prepare the strategy that could replace the description above. In addition, the Environmental Management Division may want to include additional information on EMS or the roles of individuals to supplement the sections described above.

Appendix C: Implementation Guidance by Facility

Executive Order 13148 contains many requirements for federal facilities. The main body of this plan describes those requirements in general terms. These requirements are summarized by goal in Exhibit C-1 below.

Exhibit C-1. Actions for Facilities to Achieve Goals of EO 13148

Goal 1: Develop and Implement Environmental Management Systems
- Select the NASA EMS Protocol
- Incorporate Goals of EO 13148 into Existing NASA Policies
- Conduct a Pilot Program on Life Cycle Assessment and Environmental Cost Accounting
- Select a NASA Center for an EMS Pilot Project
- Implement EMS at All NASA Facilities

Goal 2: Establish and Implement Environmental Compliance Audit Programs
- Prepare the NASA Environmental Compliance Audit Protocol
- Conduct Environmental Compliance Audits

Goal 3: Revise P2 Plan
- Revise P2 Plan

Goal 4: Report NASA Center Activities Under EPCRA
- File TRI Form R Under EPCRA Section 313 As Applicable
- Comply with Sections 301 through 312 of EPCRA
- Participate in EPA Pilot Project on Environmental Response and Restoration
- Establish Process for Community Outreach

Goal 5: Reduce TRI Releases and Off-Site Transfers
- Reduce TRI Releases and Transfers

Goal 6: Reduce Use of Toxic Chemicals, Hazardous Substances, and Other Pollutants
- Reduce Use of Toxic Chemicals
- Undertake Pilot Projects to Collect Data on Toxic Chemical Use

Goal 7: Develop a Plan to Phase Out the Procurement of Ozone Depleting Substances
- Collect Data on ODS Use
- Identify Opportunities for Elimination of ODSs

Goal 8: Implement Environmentally Sound Landscaping Practices
- Identify and Implement Environmentally Sound Landscaping Practices
- Conduct Demonstration Projects

Goal 9. Comply with E.O. 13148 Requirements and Note E.O. 13148 Recommendations
- Incorporate Goals of EO 13148 into Existing NASA Policies
- Conduct a Pilot Program on Life Cycle Assessment and Environmental Cost Accounting
- Incorporate Revised Acquisition Procedures into NASA Contracts
- Conduct Training for Personnel Involved in Environmental Management
- Incorporate Environmental Management Criteria into Position Descriptions and Performance Evaluations

Many NASA Centers have made significant progress in achieving the goals listed above due to the progressive nature of their existing environmental management program. Therefore, not every NASA facility will need to take every action listed in the exhibit. The following Center descriptions provide a basic analysis of the implementation status of the facilities and the actions that will need to be taken to help NASA achieve the goals and requirements of EO 13148. This analysis is based on information provided to the HQ Environmental Management Division by the Centers and is only current through FY 1998. The checklist used to collect the information at that time does not correspond with the goals and requirements of EO 13148, so some information was not reported. If a Center did not report information, that does not necessarily mean that the Center has not implemented projects for that goal or requirement. Some Centers may have already undertaken additional projects that will help them meet executive order requirements. Each NASA Center should review the descriptions of their status for accuracy.

The logical place to document these actions and practices is in the facility pollution prevention plan. Each NASA Center has used a different method to prepare their facility plan, so no one approach will describe the appropriate format for a pollution prevention plan. The plan's primary purpose is to serve as a guidebook for facility environmental managers and should be in a format suitable for their use. This means that each Center environmental manager will need to review their plans and determine the best way to incorporate these new actions and discussions in the plan. The descriptions below provide a brief discussion of additional information to include in the facility pollution prevention plan to make the plan consistent with the goals and requirements of EO 13148.